

RADIOACTIVE WASTE DISPOSAL IN OKLAHOMA

Radioactive waste can be divided into two major categories: high-level (HLW) and low-level (LLW). High-level radioactive waste is defined as (1) irradiated reactor fuel; (2) the liquid wastes resulting from the operation of the first cycle solvent extraction system, or equivalent, and the concentrated wastes from subsequent extraction cycles, or equivalent, in a facility for reprocessing irradiated reactor fuel; and (3) solids into which such liquid wastes have been converted. Since there are no reprocessing plants currently in operation in the United States, HLW liquids and solids described in sub-items 2 and 3 are not being produced by commercial nuclear power plants; rather, all HLW is being held in the form of spent fuel rods. All three forms of HLW have been, and are continuing to be, produced by government-owned reactors and associated facilities used for national security purposes. HLW contains unused fuel (uranium and plutonium) and fission products (radioactive fragments of the used fuel); it is intensely radioactive.

For simplicity, LLW is usually defined simply as radioactive waste which is not HLW. For the purposes of the LLW Policy Act, LLW is defined as that which is not HLW, waste containing more than 100 nanocuries of transuranic materials (for example, plutonium) per gram, and wastes which are within the scope of the Uranium Mill Tailings Radiation Control Act (UMTRCA). LLW is measured (1) by the total volume (including packaging materials) to be disposed, (2) by the radioactivity per unit volume, and (3) by the radionuclide(s) in the waste. Aside from the exception noted, LLW is generally very low in radioactivity content per unit volume although the total volume for LLW for the United States is large. The exception is the generation of LLW in nuclear power plants in the clean-up of gaseous and liquid streams before release to the environment; such LLW has a much higher level of radioactivity per unit volume, and it is a significant portion of the total volume of LLW generated.

Wastes containing more than 100 nanocuries per gram of transuranic materials require special handling and disposal in sites operated by the U.S. Department of Energy (DOE). Wastes which come under the scope of UMTRCA are generally stored above ground at the site where generated and are managed to reduce release of radioactivity in several ways.

There are no HLW disposal sites in the U.S. currently for use by commercial power reactors. The DOE is in the final stages of selecting a site; none are in Oklahoma with the nearest being in the Texas Panhandle.

Other than commercial power reactor generation of LLW, the largest generator category is medical treatment and research. The next largest category is educational, industrial, and non-medical research. Since Oklahoma has no commercial power reactors and only one low-power training reactor (located on the University of Oklahoma campus in Norman), its volume of LLW generated is quite low (only a few thousand cubic feet per year). The largest single generator is the University of Oklahoma Health Sciences Center campus in Oklahoma City.

There are no uranium mill tailings under UMTRCA in Oklahoma, and there is no HLW generated in Oklahoma.

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The Kerr-McGee Cimarron Facility (near Crescent) produced some wastes containing more than 100 nanocuries of transuranics per gram when it was in operation previously and also now during its decommissioning. These wastes were disposed of in a site on the Hanford reservation under DOE control.

The Kerr-McGee Sequoyah Fuels Corporation facility (near Gore) uses yellow cake to produce uranium hexafluoride. The principal waste material produced is treated raffinate, a liquid rich in nitrates and containing very small amounts of natural radioactivity. Due to the ammonia nitrate content, this waste is disposed of by soil farming on property owned by Kerr-McGee. This waste is not considered to be LLW in the strictest sense since it is natural (from the earth) radioactivity and the concentration is essentially background.

Exploratory tools for logging oil wells utilize radioactive sources. There have been several instances of these tools becoming permanently lost deep in a well. These wells are marked and plugged. Measures are taken to prevent future drilling into the source. The Nuclear Regulatory Commission (NRC) regulates the use of these devices. Oil field logging trucks transport these tools in marked vehicles. They also transport and use explosive devices.

U.S. Department of Transportation (DOT) primarily regulates the transportation of LLW to disposal facilities. This includes packaging, labeling and handling requirements for radioactive materials while in transit and with vehicle safety and maintenance. The Radiation and Special Hazards Service of the Oklahoma State Department of Health is the state agency responsible for LLW for Oklahoma.

There are three disposal sites for LLW in the United States: Hanford, near Richland, Washington; Beatty, Nevada; and Barnwell, South Carolina. In response to the obvious need for more LLW disposal sites, the Low-Level Radioactive Waste Policy Act was passed in 1980 which gave each state the responsibility for management of LLW generated within its borders. This Act allowed states to enter into interstate agreements to create disposal sites. Oklahoma belongs to the Central Interstate Low-Level Radioactive Waste Compact with Arkansas, Kansas, Louisiana and Nebraska. Evaluation of technical criteria lists some areas of Cimarron, Love, Marshall, Bryan, Choctaw and McCurtain counties in Oklahoma as potential LLW disposal sites. A 1985 amendment to the Act sets June 1, 1993 as the deadline for having an operational LLW disposal site.